CLAIMS

What is Claimed is:

1. A switched reluctance machine comprising:

a stator including a plurality of circumferentially-spaced stator segment assemblies with a stator segment core and winding wire wound around said stator segment core;

a rotor defining a plurality of rotor poles, wherein said rotor tends to rotate relative to said stator to maximize the inductance of an energized winding; and

a drive circuit that energizes said winding wire around said stator segment assemblies based on a rotational position of said rotor.

2. The switched reluctance machine of claim 1 wherein said stator segment core include a stack of stator plates.

3. The switched reluctance machine of claim 2 wherein said stator plates include:

a radially outer rim section; and

a tooth section that extends radially inwardly from a center portion of said radially outer rim section.

4. The switched reluctance machine of claim 3 further comprising:

an insulation layer located between said winding wire and said stator segment core.

5. The switched reluctance machine of claim 3 further comprising:

projections extending from opposite sides of a radially inner end of said tooth section.

6. The switched reluctance machine of claim 5 further comprising:

first and second end caps connected to opposite face surfaces of said stator segment core; and

first and second end cap retainer sections that extend along said projections and that connect said first and second end caps,

wherein said first and second end caps and said first and second end cap retainer sections reduce movement of said winding wire during use.

7. The switched reluctance machine of claim 2 wherein said stator plates of said stator segment core include radial and lateral slits and first and second central portions that are deformed using a punch to hold said stack of stator plates together.

8. The switched reluctance machine of claim 1 wherein said drive circuit senses rotor position using sensorless techniques.

9. In a switched reluctance machine that includes a stator, a rotor and a machine housing, an improved stator comprising:

a plurality of circumferentially-spaced stator segment assemblies that are arranged around an inner surface of said machine housing,

each of said stator segment assemblies defining a salient stator pole that extends in a radially inward direction, wherein inter-polar stator slots are defined between adjacent stator segment assemblies, and

said stator segment assemblies including a stator segment core and winding wire that is wound around said stator segment core.

10. The improved stator of claim 9 wherein said stator segment core includes a stack of stator plates.

11. The improved stator of claim 10 wherein each of said stator plates includes:

a radially outer rim section; and

a tooth section that extends radially inwardly from a center portion of said radially outer rim section.

12. The improved stator of claim 11 further comprising:

an insulation layer located between said winding wire and said stator segment core.

13. The improved stator of claim 9 further comprising:

projections extending from opposite sides of a radially inner end of said tooth section.

14. The improved stator of claim 11 further comprising:

first and second end caps connected to opposite axial ends of said stator segment core; and

first and second end cap retainer sections that extend along said projections and that connect said first and second end caps,

wherein said first and second end caps and said first and second axial end cap retainer sections reduce movement of said winding wire during use.

15. The improved stator of claim 8 wherein said stator plates of said stator segment core include radial and lateral slits and first and second central portions that are deformed to hold said stator segment core together.

16. A switched reluctance machine comprising:

a machine housing;

a rotor that rotates relative to said machine housing; and

a stator that is mounted on an inner surface of said machine housing, said stator including a plurality of circumferentially-spaced stator segment assemblies, wherein said stator segment assemblies include a stack of stator plates forming a stator segment core and winding wire that is wound around said stator segment core,

wherein each of said stator plates has a generally "T"-shaped cross-section, a radially outer rim section, and a tooth section that extends radially inwardly from a center portion of said radially outer rim section.

17. The switched reluctance machine of claim 14 further comprising:

an insulation layer located between said winding wire and said stator segment cores.

18. The switched reluctance machine of claim 14 further comprising:

projections extending from opposite sides of a radially inner end of said tooth section.

19. The switched reluctance machine of claim 16 further comprising:

first and second end caps connected to opposite axial ends of said stator segment core; and

first and second end cap retainer sections that extend along said projections and that connect said first and second end caps,

wherein said first and second end caps and said first and second end cap retainer sections reduce movement of said winding wire during use.

20. The switched reluctance machine of claim 14 wherein said stator plates of said stator segment core include radial and lateral slits and first and second central portions that are deformed to hold said stator segment core together.

21. The switched reluctance machine of claim 14 further comprising:

a drive circuit connected to said winding wire of said stator segment assemblies, wherein said drive circuit senses rotor position using sensorless rotor techniques.